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A Method of Grading and Valuing Operations

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ALL operations in our tailoring departments at the Joseph and Feiss Company are on a piece-work basis. Those in the cutting department are on a premium system.

The process of arriving at a piece rate for any specific operation involves three main steps, viz.: (1) determining the best method and standardizing appliances and conditions; (2) determining the best rate of output that can reasonably be expected of an operative who is adapted to the work and fully skilled in performing it, by the method chosen; (3) determining the value of such work per hour or per forty-four hours when performed at the standard rate. The piece rate is arrived at by dividing the hourly rate thus determined by the rate of output.

For instance, if we decide on the basis of careful time studies that in operation A the standard rate of performance under the specified conditions, with the specified appliances and the like, is to perform this operation on twenty-five garments per hour, and that the value of this work at this rate of performance is \$1.25 per hour, the resulting piece rate is 5c per garment or \$5 per one hundred garments. In like manner, the performance standard on operation B may be seventy-five garments per hour and the determined value of such work 90c per hour, which results in a piece rate of 1.2c per garment or \$1.20 per one hundred garments.

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Determining the performance and time standards is a technical process involving detailed elementary time study, standardization and control of operating conditions, appliances and methods, application of delay and fatigue factors and the like, an explanation of which is not important for the purposes of this article.

The illustration of the two operations cited above exemplifies two important problems that are involved in the valuation of an operation. First, there is the relation of one operation to another as shown by the fact that the one is valued at \$1.25 per hour, the other, at 90 cents per hour when both are performed at the standard rate: the former is valued 35 cents an hour or *38 per cent more than* the latter. Second, there is a relation to the general wage level represented by the fact that these two rates are \$1.25 and 90c rather than \$1.75 and \$1.26 or 75c and 54c or any other pair of rates in the same proportion. The same discussion of these two questions with reference to grading of piece work operations will also apply to the other operations for which there are valid production standards.

Among the factors that determine that the rate for the one shall be 38 per cent higher than the rate for the other are the factors of skill and the time required to learn the operation.

THE FACTOR OF SKILL IN RELATIVE VALUATIONS

Skill is something which we all talk about but for which there is no standard definition. And it is difficult to

define. We consider that it has reference to the following elements, viz.: (1) the character of the work elements that compose the whole operation, particularly the care with which they must be performed in order not to impair the quality of the product, together with the worker's required knowledge and ability not only to judge effects after they have been produced but to *foreknow* them; (2) the complexity of the motions; (3) variation and complexity of the whole operation; (4) the type of operative that is adapted to the operation and the experience that he must have had in the organization in order to be properly qualified for the operation in question. An excellent example of this first element is in hand pressing, where the operative must be able not only to recognize the quality of the effect he has produced, but to pre-judge this effect on each kind or texture of cloth and thereby know how to treat it.

In determining the character and complexity of the motions that compose an operation, and the complexity of the operation as a whole, the careful analysis made by the time study observer is extremely valuable. The experienced time study observer is able to grade the elements from the character of his readings. The greater the number of difficult elements in the whole operation, the higher the grade.

A good comparison to illustrate the meaning of the third element is the comparison of the relatively short, simple and uniform operation of sewing wigans or rectangular silesia pieces onto the bottoms of coat sleeves to stiffen them, with the lengthy, very complex and variable operation of "pocket making" in which the operative must know how to put in all kinds of pockets—flap, horizontal welt, vertical welt with inlaid facing, slanting

welt, crescent shaped pockets, piped edges, patch pockets and the like.

Finally, some operations are of such character that the operative is not properly qualified to perform them unless he knows the work that has gone before or that is to follow. Several years' work on other parts of the garment making process may be required of an operative before he can acquire the knowledge and understanding needed for the operation in question. General experience with operations as performed under the general conditions in the organization may also be essential. Furthermore, even without such versatility, some operations involve a longer training period than others before the operative can come up to the standard rate of performance.

Thus skill, as above defined and judged, and the length of time normally required to bring the operative up to full proficiency in the given operation, inclusive of the time required to learn operations that lead up to it, are the factors that govern the relative valuations of the various operations. On this basis all operations are divided into grades known as classes. The values of these classes progress with a common difference of 5 or 10 cents per hour from the operations of the lowest to those of the highest class.

This difference of 5 or 10 cents per hour between adjacent classes has a practical significance. It is large enough to constitute a sufficient inducement to operatives on one class of operation to seek advancement to the next higher class. With a smaller difference the added earning power often would not be considered worth the trouble of learning operations in the next higher class.

Furthermore, this careful classification of operations enables us to offer prospects of an attractive career by our adopting a policy of recruiting new

employees only in the lowest classes and filling all personnel needs in a higher class by advancement from a lower class.

RELATIVE GRADATIONS FROM GENERAL WAGE LEVEL

Now comes the second question, namely, that of the wage level. We establish starting rates in the lowest classes that aim to afford, for the type or grade of employe wanted, a reasonable subsistence which takes into consideration the prevailing rate in similar industries in the locality and is sufficient to attract the grade of worker wanted in sufficient numbers. This subsistence rate is the employe's guaranteed rate, no matter what his piece-work earnings are. We determine the piece rates in these lowest grades so that when the operative comes up to standard he will earn from 25 per cent to 33 $\frac{1}{3}$ per cent more than this minimum. This establishes the lowest class. The differential of 5 or 10 cents per hour per class does the rest.

We also obtain a basis of check upon this process at the top of the scale. By the time we arrive at that type, we have employes of such length of service, variety of training and versatility that they compare favorably with the most skilled craftsmen in the industry. Naturally their wage-rates must also compare favorably.

All new operatives are put through a course of training in our vestibule training school and commence work in the lowest classes of operations. This is done whether or not the newcomer has been classed elsewhere as a "skilled craftsman." For no matter how "skilled" he may be under the almost universally prevailing method of conducting work in the clothing industry, he is not skilled in working by our standard methods, under our plan of performance standards, nor is he in-

structed in and filled with the spirit of our plan of organization. However, if he *does* come to us a skilled craftsman his progress will be vastly more rapid than otherwise; he will consume only weeks or at most months in progressing to the grade of operations in which he has been rated as skilled as against years without such previous trade experience.

Any plan of wage-rate determination must, in order to be satisfactory, satisfy the workers affected on two questions that they raise either explicitly or unconsciously, viz: (1) Are the earning rates sufficient? (2) Are the various rates fair, relatively, one to another? The question of sufficiency refers not merely to what is needed for living but to other rates for the same grade of work in the community. The question of fairness involves such ideas as "equal pay for equal work," "more pay for harder work," and the like. We believe that our method of determining and adjusting wage-rates yields satisfactory answers to these questions.

Particularly is this true because we do not impose any determination or adjustment by arbitrary methods. We systematically review our classifications four times a year. We consider every operation and maintain or advance its class according to careful weighing of its contents. We drop an operation to a lower class whenever the operation itself has been changed so as to include a smaller proportion of the more difficult and valuable work elements. We submit to a wage committee and to the operatives affected, our revisions with our reasons in advance of the pay period in which they are to go into effect; this gives the operatives time and opportunity to consider them and protest if they deem the revision wrong. Any such differences of opinion are carefully threshed out with the employes through

their representative and the Employes' Council. Lowering the class of an operation occurs with great infrequency. When this is done, opportunity is sought to advance the operatives so affected to a higher class so that their earnings will not suffer. We have never yet been able fully to man the operations in our highest classes.

In the above we have been discussing basic wage-rates, their determination and adjustment. These are supplemented in our factory by bonuses. There is a daily production bonus which is paid to each operative who maintains his output at the standard rate; a daily quality bonus which is paid to each operative who avoids rejections for defects of workmanship; a daily attendance bonus that is paid to each operative whose attendance for the day is perfect and who reports for work on time at the beginning of the next work day and a daily length of service bonus that is graduated according to the number of years the individual has been in the company's continuous employ.

INTER-FACTORY VALUATION PROCESSES

This process of analyzing, classifying and relatively valuing operations within a factory should also be applicable to operations in different factories and different industries. Two things are requisite in such application, viz: (1) The performance standards must be

determined by similar methods. (2) The analyzing, classifying and valuing must also be accomplished by similar methods. In other words, these processes must themselves be standardized.

Furthermore, when it comes to relatively valuing processes in different factories and particularly in different industries, at least one additional factor must be taken into consideration, namely, the degree of unemployment hazard. Degree of exposure to personal injury and to health deterioration are also factors. The latter may vary within the factory as well as from industry to industry.

In conclusion, while the extension of this process of analysis and classification to the comparison of work in different industries undoubtedly is desirable, it may not be practicable at the present stage in the development of industrial management. In altogether too few plants and industries have there been carried on the careful scientific analysis and study of processes, the standardization of work-content, appliances, conditions and methods and the determination of performance standards that must be the foundation of such classifications. The more rapidly plants in all industries come to this basis of management and analyze, classify and relatively value the various operations *within* the plants, the more rapid will be the progress toward valid classifications and relative valuations of processes *between* industries.